IOT based Air and Sound Pollution Monitoring System

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Abstract— The pollution of air and sound is overhasty. To bring it in check its monitoring is extremely counsel to win this issue, we are lunching a system through which the extent of sound and therefore the esse of harmful gases within the gird are frequently detected. The fatten pollution at such an alarming rate has started creating trouble for the living ones, maybe its high bruit or toxic gases present within the environment leaves a harmful effect on living beings health and thus needs a certain attention.

Keywords— air pollution , sound pollution , sensors, IOT sensors , monitoring system, raspberry Pi.

1. Introduction:-

In this era of modernization, technologies are making rapid progress. A day we feel some new technology coming in market to simplify our lives . Back in time checking the pollution during a particular frequency was a really tedious task which which wasn't very efficient although. With rapidly increasing pollution and rapidly advancing technology various new methods were also introduced to stay and fix the rapid increase in polluted area by skillfull activites. Only internet of things is one among the newest works that has been wiped out this path. The increment in use of internet and therefore the interaction of living one's with the machine gave rise to IOT. It allows exchange of information among various devices like fridge, automatic washer , automobiles, digital watches etc. This information exchange within the assistance numerous sensors. The account for the success of IOT is its efficiency and makes it a easily accessible technology at lower prices. Air and Noise impurities are two main constituents that have the leading unfavourable effect on living things also because of the entire globe. Therefore it's crucial to observe it and control it. Traditional procedure involves manual addition which data cruiser won't to visit the location to gather the information, survey about it and perform comparisons to supply the output which was very lengthy and time consuming besides inept.

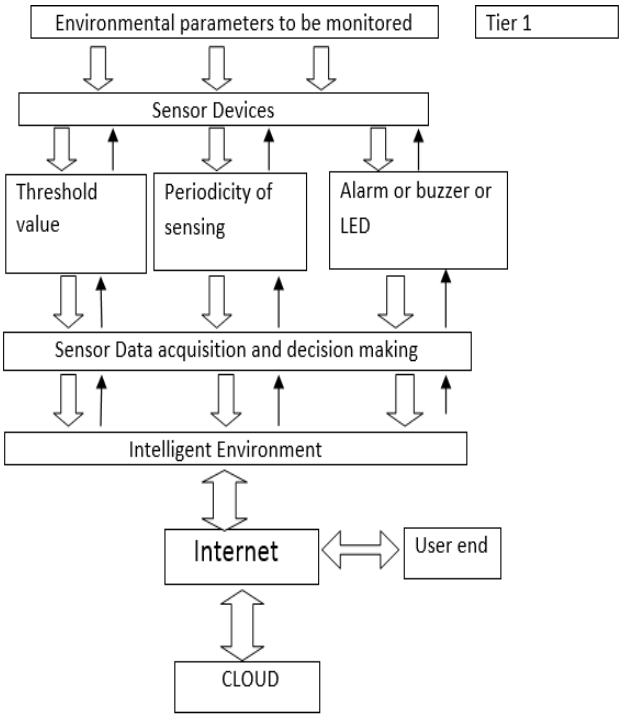
The pollution monitoring system involves use of sensors which measures the noise pollution attentiveness and dock harmful gases like CO and SO_2 which mainly pollutes the ozone. Comparisons are done automatically using previously stored data in datacenter and output is stored on cloud to form it's accessible from remote control zones. This conference paper involves description of the system that presents its yield with the assistance of an android application which the user can download in their automobile phones access it whenever anyone need it. This is often used for notifying the hearth bridge authorities and fire brigades itself if and fire has taken place within the zones. This device may be a useful asset to save lots of precious lives of sole and properties.

2. SYSTEM MODULE AND ASSUMPTIONS

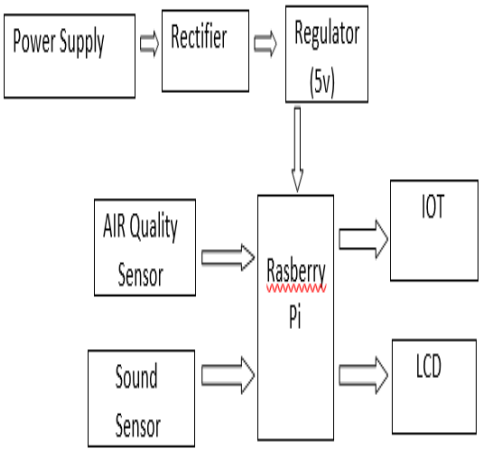
Here, the tier 1 provides knowledge of the parameters under the region which is to monitor for noise and somginess control. Tier 2 deals with sensor deivces with suitable characteristics, features and every single sensor are operated and hold their sensitivity also because if the area of sensing. In b/w tier 2 and tier 3 obligatory sensing and controlling actions are going to be taken depending upon the drastic conditions, like fixing the edge value , periodicity of sensing, messages (buzzer or alarm) etc. Based on the data interpretation performed b/w tier 2 and tier 3 and from previous groundings the parameter threshold values during normal working conditions that are determined. Tier 3 tell us about the data acquisition from sensor devices and includes the decision making. Which specially specify the condition that the data is representing which parameter . In the proposed tier 4 deals with the intelligent atmosphere. Which means identify the variations in sensor data and specially fixed the threshold values that depends on identified range of CO and noise pollution levels. In this , sensed data will able to processed and store it in the cloud which is generated i.e., in to the Google spread sheets and it will show a trend of the sensed parameters w.r.t respect to the specified values. The end users can browse the data using automobile phones, PCs etc.

The main objective of IOT air and sound monitoring system is that the air and sound pollution is growing issue these days. It is necessary to watch air quality and keep it in check for a far better future and healthy living for all of us. Here we present an air quality and noise pollution in an area through IOT.

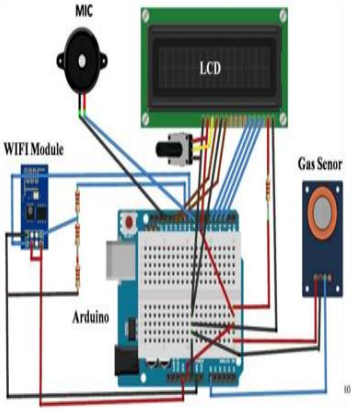
System uses air sensors to sense existence of harmful gases/ compounds within the air itself and constantly transmit the all outcome. Also , system keeps measuring sound level and report it constantly. The sensors interact with raspberry pi which processes the data and transmit's it over the cloud then to the gadgets. This allows authorities to watch air and noise pollution in several areas and then act against it.



3. Block Diagram :-

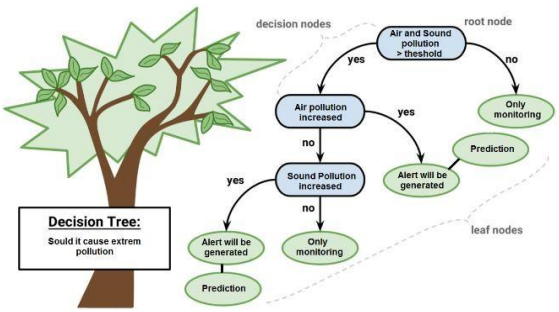


4. System Architecture :-



5. Algorithm

A decision tree may be a flowchart-like structure during which each internal node represents a "test" on an attribute (e.g. whether a coin flip comes up heads or tails), each branch represents the result of the test, and every leaf node represents a category label (decision taken after computing all attributes). The paths from root to leaf represent us about classification of rules. In decision we survey, a choice tree and therefore the closely related influence diagram are used as a visible and analytical decision support tool, where the expected values (or expected utility) of competing alternatives are calculated. a choice tree consists of three sorts of nodes: Decision nodes typically represented by squares Chance nodes typically represented by circles End nodes typically represented by triangles Decision trees are commonly utilized in research and operations management. If, in practice, decisions need to be taken online with no recall under incomplete knowledge, a choice tree should be paralleled by a probability model as a most suitable option model or online selection model algorithm. Another use of decision tree is as a graphic means for calculating conditional probabilities.



6. Working Of The Project :-

Here we propose an air and also noise pollution quality monitoring system that permits/ allow us to check and watch air quality also as noise pollution in an area through IOT. System uses air sensor to sense presence of harmful gases / compounds within the air and constantly transmit that data to the user. Also, system keeps measuring sound level and report the data immediately. The sensors intract with raspberry pi which processes this data and transmits it over the appliance. This allows us the authorities to watch pollution in several areas and act against it. Also, same for sound pollution authorities can keep a watch on sound pollution near traffic and no honking areas.
Network devices and therefore the internet of things (IOT) all types of ordinary housegadgets are almost modified to figure in an IOT system. Wi –Fi network adapters , cameras , microphones and other instrumentation are often embedded in such kind of devices to enable them for addition of IOT.

7. Literature Survey :-

The motive of creating a sensible city are often fulfilled by using technology, thus making the life better and also enhancing the quality of services, therefore meeting every individual's needs. With modern technology in fields of information and communication, it has become easy to interact with the authorized people of the city to inform the whereabouts of the world or city, how well the town is developing, and how to make it possible to achieve a better life quality. In this system, an application was created to make one more step in the fulfillment of the goal. An area is analyzed for evaluating how much pollution is affecting the area. The components of gases and their amounts are calculated and checked. If the amount is higher than normal then the officials are reported about it. After that, the people are made to clear the area and taken to a safe place. The combined network architecture and the interconnecting mechanisms for the accurate estimation of parameters by sensors are being explained and delivery of data through internet is presented. Some of the research work made for monitoring the pollution parameters during a particular location so as to make the environment safe which area smart. Different methods were utilized in the past and are described during this section. First is Smart Environment Monitoring using wireless sensor networks in which the main focus was on developing an environment freed from pollution by making it smart. Wireless sensors are fitted all over the city and in public transports. By monitoring all the sensor networks, all the environmental happenings can be gathered as a streaming database to analyze the environmental position. The monitoring data gathered from stationary nodes installed in the city to the mobile nodes placed on public transports is given by this technique. Second is Toward a Green campus with the web of things. It is an implementation of an idea to save lots of energy through adequate management of computer machines and air conditioning. It is supported by the idea of the internet of things. The third is WSN- and IOT based Smart Homes and their extension to Smart Buildings. This work is predicated on the utilization of reliable, efficient, real-time, and economical sensor networks for creating smart homes. In this, the sensor nodes are fitted into the various areas of the home. These nodes produce data of the movement wiped out the house or any usage of an object. Further, these homes are extended to smart buildings.

8.RESULT

The air and sound pollution monitoring system monitors air and noise pollution by employing a mobile application. It shows the digital value of air and noise pollution and the user can analyze it with a graph. It becomes very easy for us to rectify the amount and air and sound pollution around and plan for healthy living and surroundings. The figures that are included in our paper shows the way the system works and the way the output is obtained from the input after processing.

9. Conclusion :-

The Automatic Air & Sound management system may be a breakthrough to contribute an answer to the most important threat. The air & sound monitoring system overcomes the matter of the highly-polluted areas which may be a major issue. It supports new technology and effectively supports a healthy life concept. This system has features for the people to watch the quantity of pollution on their mobile phones using the appliance.
So, it becomes very reliable and efficient for the Municipal officials alongside the Civilians to watch the environment. Letting civilians also involved in this process adds an extra value to it. As civilians are now equally aware and interested in their environment, this idea of IoT is useful for the welfare of society. And it is implemented using the latest technology.

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